



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/673,005 | 11/27/2000 | Emmanuel Hadji | 33019 | 7399 |

7590 08/19/2002

Pearne Gordon McCoy & Granger
Suite 1200
526 Superior Avenue East
Cleveland, OH 44114-1484

EXAMINER

AHMED, SHAMIM

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1765

DATE MAILED: 08/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-7

Office Action Summary

Application N .

09/673,005

Applicant(s)

HADJI ET AL.

Examiner

Shamim Ahmed

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: In lines 9 and 19, the word "approximately" is not a positive limitation. The word "approximately" should be simply deleted. Appropriate correction is required.
2. Claim 14 is objected to because of the following informalities: In line 2, the silicon layer (34) should be " the silicon layer (32) "

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claim 1 recites the limitation "said determined thickness" in line 11. There is insufficient antecedent basis for this limitation in the claim.
6. In claim 1, line 10, the phrase "with a thickness greater than (or less than)" makes the claim indefinite because the inclusion of the parenthesis is not clear. Applicants should simply delete the parenthesis. Same analysis apply in the claim 1, line 18.

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Bowers et al (5,985,687).

Bowers et al disclose a method for bonding a silicon block with a support (figures 1-2).

Bowers inherently teach that silicon substrate or silicon block is covered with silicon oxide because silicon substrate includes some degree of oxide layer on it.

Bowers et al also disclose that after fusion or bonding the silicon substrate is thinned using polishing and then forced to cleave parallel to the crystal planes of the substrate (col.5, line s26-34 and col.6, lines 3-21).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1765

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bowers et al (5,985,687) as applied to claims 1-2 above, and further in view of Ohmura et al (4,848,272).

Bowers et al discussed above in the paragraph 7 but fail to disclose to increase the thickness by crystalline growth. It would have been obvious to one skilled in the art to increase the thickness if the thickness is less than the predetermined thickness and furthermore, crystalline growth is conventional technique to form an epitaxial layer on a silicon substrate as supported by Ohmura et al. Ohmura et al teach that crystalline growth is conventional to provide a high quality thin film having uniform thickness over a semiconductor substrate (col. 1, lines 10-14 and col.2, lines 3-7).

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bowers et al (5,985,687) as applied to claims 1-2 above, and further in view of Bruel (5,374,564).

Bowers et al discussed above in the paragraph 7 but fail to disclose that the cleavage area is formed using hydrogen implantation. However, Bruel teaches that hydrogen implantation is advantageously used to a silicon substrate in order to promote the breaking process (col.5, lines 29-45). Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Bruel's teaching into Bowers et al's process for promoting the breaking process of the silicon block or silicon substrate.

Art Unit: 1765

11. Claims 5-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramdani et al (5,835,521) in view of Bowers et al (5,985,687).

Ramdani et al disclose a bragg mirror structure (10) including alternating layers of silicon oxide and a silicon material utilizing epitaxial growth technique and /or wafer bonding. As to claim 6, Ramdani et al teach that silicon oxide layer is formed by standard epitaxial growth technique including CVD or PECVD technique (col.3, lines 18-25). Ramdani et al also disclose that an optical component is formed by fabricating a vertical cavity surface emitting laser or active region on the bragg mirror (col.3, lines 9-55). Ramdani et al also teach that a second mirror (42) is disposed over the active region (col.6, lines 4-24).

Ramdani et al fail to teach the formation of silicon layer as the context of claim 1 namely bonding a silicon block with a support, cleaving the silicon block and thinning the surface layer to a desired thickness. However, Bowers et al disclose a method for bonding a silicon block with a support (figures 1-2). Bowers inherently teach that silicon substrate or silicon block is covered with silicon oxide because silicon substrate includes some degree of oxide layer on it.

Bowers et al also disclose that after fusion or bonding the silicon substrate is thinned using polishing and then forced to cleave parallel to the crystal planes of the substrate for providing a desired thickness for the mirror (col.5, lines 26-34 and col.6, lines 3-21). Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Bowers et al's teaching into Ramdani et al's process for providing a predetermined thickness of the silicon layer for the mirror as taught by Bowers et al.

Art Unit: 1765

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Samata et al (6,008,110) disclose a method for thinning a bonded semiconductor substrate; Pautrat et al (6,013,912) disclose a multispectral resonant-cavity detector having two bragg mirror with active region or cavity.

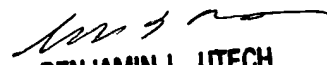
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (703) 305-1929. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Shamim Ahmed
Examiner
Art Unit 1765

SA
August 14, 2002


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700